CLAIMS

I claim:

1. An apparatus comprising:

a protection circuit to provide overvoltage protection and backflow current protection when used to charge a battery from an external power source, in which source voltage of the external power source exceeds nominal value of a rail voltage supplied by the battery, the protection circuit to accept the source voltage, but to ensure that node-to-node potential on circuit components to not exceed a specified value when the external power source is used to charge the battery and to prevent backflow current from the battery to the external power source when voltage of the external power source drops below voltage of the battery; and

a switching circuit to switch a mode of operation of the protection circuit between the overvoltage protection and the backflow current protection.

2. The apparatus of claim 1, wherein the switching circuit switches the mode of operation of the protection circuit by changing a bias applied to the protection circuit.

3. The apparatus of claim 2, wherein the protection circuit uses a floating well transistor, in which its gate is to be biased by the switching circuit when in the overvoltage protection mode of operation, to ensure that the node-to-node potential on the circuit components does not exceed the specified value.

4. The apparatus of claim 2, wherein the protection circuit uses a floating well transistor, in which its gate is to be biased by the switching circuit when in the backflow current protection mode of operation, to turn off the floating well transistor to eliminate a current path from the battery to the external power source.

5. The apparatus of claim 3, wherein the switching circuit receives input voltage from the external power source to be switched to establish the bias voltage to the floating well transistor during the overvoltage protection mode of operation.

6. An apparatus comprising:

a protection circuit to provide overvoltage protection and backflow current protection when an external voltage is received through a data transfer link and used to charge a battery, in which the external voltage exceeds nominal value of a rail voltage

supplied by the battery, the protection circuit to accept the external voltage, but to ensure that node-to-node potential on circuit components to not exceed a specified value when the external voltage is used to charge the battery and to prevent backflow current from the battery to the data transfer link when the external voltage drops below battery voltage;

a biasing circuit to bias the protection circuit; and

a switching circuit to change the bias applied by the biasing circuit to selectively switch a mode of operation of the protection circuit between the overvoltage protection and the backflow current protection.

7. The apparatus of claim 6, wherein the protection circuit uses a floating well transistor, in which its gate is to be biased by the switching circuit when in the overvoltage protection mode of operation, to ensure that the node-to-node potential on the circuit components does not exceed the specified value.

8. The apparatus of claim 7, wherein the protection circuit uses the floating well transistor, in which its gate is to be biased by the switching circuit when in the backflow current protection mode of operation, to turn off the floating well transistor to eliminate a current path from the battery to a line of the data transfer link that supplies the external voltage.

9. The apparatus of claim 8, wherein the external voltage is received from a Universal Serial Bus link.

10. A protection circuit to use with a battery to provide overvoltage and backflow current protection comprising:

a first transistor to receive an external voltage from an external power source and to operate as a current source to charge the battery;

a second transistor disposed between the first transistor and the battery, in which biasing of a gate of the second transistor determines mode of protection provided;

the second transistor uses a floating well to provide overvoltage protection to internal circuitry of an integrated circuit supplied by the battery when external voltage is applied to power the internal circuitry and to charge the battery;

the second transistor also uses the floating well to provide backflow current protection to the external power source when the external voltage drops below battery voltage;

a biasing circuit to bias the gate of the second transistor to place the second transistor in either the overvoltage protection or backflow current protection mode of operation; and

a switching circuit to change the bias applied by the biasing circuit to switch the mode of operation between overvoltage protection and backflow current protection.

11. The protection circuit of claim 10, wherein a first bias voltage applied to the gate of the second transistor, when in the overvoltage protection mode of operation, ensures that voltage beyond a specified value, which is less in magnitude than the external voltage, is not impressed across either the first or second transistors.

12. The protection circuit of claim 11, wherein a second bias voltage applied to the gate of the second transistor, when in the backflow current protection mode of operation, ensures that the second transistor is turned off to eliminate a current path from the battery to the external power source when the external voltage drops below battery voltage.

13. The protection circuit of claim 12, wherein the biasing circuit further includes an input circuit to set the first bias voltage and the switching circuit to switch the first bias voltage onto the gate of the second transistor when the external voltage is present.

14. The protection circuit of claim 13, wherein the biasing circuit further includes a resistor to couple the battery voltage to the gate of the second transistor to provide the second bias voltage, if the first bias voltage is removed from the gate of the second transistor and the battery voltage is greater in magnitude than voltage at an opposite terminal of the second transistor.

15. The protection circuit of claim 14, wherein the external voltage is received from the external power source through a data transfer link.

16. The protection circuit of claim 15, wherein the data transfer link is a Universal Serial Bus.

17. A method of providing overvoltage protection and back flow current protection comprising:

linking an external voltage to charge a battery and to power circuitry of an integrated circuit powered by the battery;

providing a first biasing to a protection circuit to prevent excessive external voltage from being applied to the circuitry, when the external voltage is linked to the integrated circuit;

providing a second biasing to the protection circuit to prevent backflow current flow from the battery to external source of the external voltage, when the external voltage drops to a specified voltage below that of the battery;

switching between overvoltage protection and backflow current protection modes of operation by switching in the first or second biasing based on a value of the external voltage.

18. The method of claim 17, wherein the first and second biasing are provided to a transistor having a floating well, in which the first biasing allows current flow to charge the battery, but prevents more than a specified voltage to be dropped across circuit components of the integrated circuit, and the second biasing causes the charging circuit to be opened to prevent backflow of current.

19. The method of claim 18, wherein the second biasing is provided as a default biasing when the first biasing is removed.

20. The method of claim 17, wherein the linking links the external voltage as a component of a data transfer link.

21. The method of claim 17 wherein the linking links the external voltage as a component of a Universal Serial Bus.